REMARKS

The Office Action dated 15 December 2003 has been reviewed. Claims 1, 2, 6-8 and 17 have been cancelled without prejudice or disclaimer, claims 3, 5, 10, 11, 14 and 15 are currently amended, claims 4, 9, 12, 13 and 16 were previously presented, and new claims 18-20 have been added. Thus, claims 3-5, 9-16 and 18-20 remain pending and are submitted for reconsideration. No new matter has been added.

The drawings were objected to under 37 C.F.R. § 1.83(a) for allegedly failing to show the features of claim 17. This objection is respectfully submitted to be moot in view of the cancellation, without prejudice or disclaimer, of claim 17.

Claims 1, 5-7 and 9-14 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent 2,930,404 to Kowalski et al. (Kowalski). Claims 1, 2, 6, 11, 12, 15 and 16 were rejected under 35 U.S.C. § 103(b) as allegedly being anticipated by U.S. Patent 5,476,079 to Kanamori et al. (Kanamori). Claims 1-4 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent 4,646,976 to Rembold et al. (Rembold). These rejections are respectfully traversed in view of the following comments.

Claim 18 recites a combination of features including "an annular space (60) defining an equalization channel between the flattenings (58), the annular space (60) being bordered by the plunger (36) and the wall of the pole core (21), the annular space (60) providing fluid communication between the end faces of the pole core (21) and the flow terminal (T)." Support for these features may be found in Applicants' substitute specification at, for example, page 6, line 29, to page 7, line 2.

Kowalski shows a solenoid valve with plunger 98 that is guided in insert 41 by a bushing. As described in column 3, lines 39-45, Kowalski's bearing hole 100, in which plunger 98 is guided, is sealed off by O-ring 102. Medium cannot therefore pass up through this bearing hole as shown in Kowalski's Figure 4. A second seal in the form of an O-ring 112 is provided in annular groove 114 in the outside of bushing 41. This second seal 112 also stops the medium from passing up in the area between housing 11 and bushing 41 as shown in Kowalski's Figure 4. Thus, the two end faces of Kowalski's pole core 43 are not connected to flow terminals 30,70. Thus, Kowalski fails to teach or suggest Applicants' "annular space (60) providing fluid communication between the end faces of the pole core (21) and the flow terminal (T)."

Further, Kowalski fails to teach or suggest Applicants' "flattenings (58)" as recited in claim 18. Specifically, it is respectfully submitted that Kowalski's plunger 98 does not have any flattenings at its ends, but is instead completely cylindrical.

For at least these reasons, it is respectfully submitted that Kowalski fails to teach or suggest Applicants' invention as a whole, and independent claim 18 is therefore allowable over Kowalski. Further, claims 3-5, 9-16, 19 and 20 depend, directly or indirectly, from claim 18 and are respectfully submitted to also be allowable for at least the same reasons, as well as for the additionally recited features that further distinguish over Kowalski.

Kanamori appears to show a solenoid valve in which two end faces of pole core 40 are connected with flow terminal 31a via hole 40a. However, Kanamori fails to teach or show a "plunger (36) including flattenings (58) at its ends proximate end faces of the pole core (21)" and "an annular space (60) defining an equalization channel between the flattenings (58), the annular space (60) being bordered by the plunger (36) and the wall of the pole core (21)," as recited in Applicants' independent claim 18. Specifically, Kanamori's plunger 41 has no flattenings at its ends. It is, on the contrary, of a completely cylindrical design and its outer shell area lies against the inner wall of bushing 42.

Similarly, Rembold suffers from the same deficiencies as Kanamori. Specifically, Rembold's plunger 17, as illustrated in Figures 1-3, appears to show two collars 18,19, does not have any flattenings at its ends. Again, both ends of plunger 17 are cylindrical in design.

For at least these reasons, it is respectfully submitted that both Kanamori and Rembold fail to teach or suggest Applicants' invention as a whole, and independent claim 18 is therefore allowable over Kowalski or Rembold. Further, claims 3-5, 9-16, 19 and 20 depend, directly or indirectly, from claim 18 and are respectfully submitted to also be allowable for at least the same reasons, as well as for the additionally recited features that further distinguish over Kanamori and Rembold.

It is respectfully submitted that Kowalski, Kanamori, and Rembold, whether considered separately or in combination, fail to teach or suggest a plunger with the flattenings at its ends, as recited in Applicants' claim 18.

Solenoid valves according to Applicants' invention have a number of advantages. For example, the flattenings 58 at the end of plunger 36 act like chokes, and are therefore not temperature-dependent. This again has the advantage that the annular space between plunger 36

and the inside wall of the axial hole in pole core 21 can be large in the area between flattenings 58. The influence of temperature can be prevented by this large annular space 60. This temperature effect is of great benefit for damping armature space 56 via the pressure equalization between the two faces of pole core 21 for cleaner non-temperature-dependent pressure characteristics at high and low temperatures.

In contrast, the solenoid valve according to Kanamori, for example, provides hole 40a to connect the two end faces of pole core 40. This hole 40a is long and thin, which results in pronounced temperature dependency. This may not be a disadvantage for an on/off valve but it plays a large and crucial role in a proportional valve such as in the object of the application.

With regard to new claim 19, the intermediate pole core 48 can be used for linearization of the magnetic current characteristic. Due to the partial overlapping of intermediate pole core 48 by flat armature 38, both the linearization and increase in the magnetic current characteristic can be optimally and simply adjusted.

With regard to new claim 20, there are a number of advantages. First, this design makes it possible to simplify the production of flat armature 38 since no holes are needed for plug contacts 16 to go through. And second, one does not have the problem of friction being caused by guiding plug contacts 16 through flat armature 38.

CONCLUSION

It is respectfully submitted that the application in now in condition for allowance and an early notification of such is earnestly solicited. Should the Examiner feel that there are any issues outstanding after consideration of this reply, the Examiner is invited to contact Applicant's undersigned representative to expedite the prosecution.

EXCEPT for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§ 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 50-0310. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully submitted,
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